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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/062,543 | 02/05/2002 | Noritaka Kamikubo | 900-418 | 3129 |
| 23117 | 7590 | 02/12/2004 | EXAMINER | |
| NIXON & VANDERHYE, PC 1100 N GLEBE ROAD 8TH FLOOR ARLINGTON, VA 22201-4714 | | | TRINH, HOA B | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2814 | |

DATE MAILED: 02/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|-----------|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/062,543 | KAMIKUBO, NORITAKA | |
| | Examiner | Art Unit | <i>pw</i> |
| | Vikki H Trinh | 2814 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on ____.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) Claim(s) ____ is/are allowed.
- 6) Claim(s) 1-10 is/are rejected.
- 7) Claim(s) ____ is/are objected to.
- 8) Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on ____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. ____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

| | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date ____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date ____. | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Objections

1. Claims 1, 9-10 are objected to because of the following informalities: In claim 1, line 9, the term “excessively” is a relative term. In claim 9, line 10, the terms “not excessively” need to be positively recited. In claim 10, line 5, the terms “not at any central” need to be positively recited. In addition, the term “central” is vague. Further, in claim 10, line 9, the terms “not excessively” need to be positively recited. Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 4-5, 7 are rejected under 35 U.S.C. 102(e) as being anticipated by Kuehne et al. (6,372,605).

As to claim 1, Kuehne et al. (6,372,605) discloses a method of making a semiconductor device having the steps of forming elements 142, 142a, 145, 146 (fig. 1c), 442, 445, 446, 444 (fig. 4A) on a wafer 140 (fig. 1C), 440 (fig. 4A), and after forming an interlayer insulating film 148 (fig. 1c), 448 (fig. 4B) over at least the elements, flattening an interlayer insulating film 148, 448 formed by CMP (col. 2, line47-48) , and wherein a stopper layer 146 (fig. 1c, col.2, lines 49, 61-67), 446 (fig. 4B) is formed only at the edge (fig. 1c) of “the device” which would be

“excessively” polished through the CMP, wherein the stopper 146, 446 is formed before the insulating film layer 148 (col. 2, lines 18-20), 448.

As to claim 4, the stopper layer is a silicon nitride. See col. 2, line 49, and col. 5, lines 60-61.

As to claim 5, the interlayer insulating film is a silicon oxide film. See col. 2, line 48, and col. 5, line 49.

As to claim 7, the stopper is removed after CMP. See col. 2, lines 51-55.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 2-3, 6, 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuehne et al. (6,372,605).

As to claims 3 and 6, Kuehne et al. (6,372,605) discloses the invention substantially as claimed as claimed, which further including the step of forming a connection hole 144 (fig. 1A), 444 (fig. 4A). However, Kuehne et al. (6,372,605) does not teach a width dimension of the stopper layer compared to a resist layer, in particular with a range of 3-4 mm. Nevertheless, it would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Kuehne et al. (6,372,605) with the stopper layer being greater than that of the resist layer to be removed in the photolithography step, since it is *prima facie* obvious to an artisan to provide the width dimension range for optimization and experimentation, because applicant has not yet provided any criticality for the range.

As to claims 2 and 8, Kuehne et al. (6,372,605) discloses the invention substantially as claimed. However, Kuehne et al. (6,372,605) does not teach that the stopper layer has a thickness greater than the thickness of the interlayer insulating film with a specific range of 50-700 angstrom. Nevertheless, it would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Kuehne et al. (6,372,605) with the stopper layer being greater in thickness than that of the insulating, since it is *prima facie* obvious to an artisan to provide the specific range of thickness for optimization and experimentation, because applicant has not yet provided any criticality for the range.

Note that the specification contains no disclosure of either the critical nature of the claimed dimensions of any unexpected results arising therefrom. Where patentability is aid to be based upon particular chosen dimensions or upon another variable recited in a claim, the applicant must show that the chosen dimensions are critical. (*In re Woodruff*, 919 F.2d 1575, 1578 (Fed. Cir. 1990).)

Response to Arguments

7. Applicant's arguments filed 12/02/03 have been fully considered but they are not persuasive.

In applicant's remarks, applicant alleges that the cited reference, Kuehne, fails to disclose all of the elements the present claim 1 because claim 1 requires "a stopper layer is formed only at an edge region of the device where otherwise the interlayer insulating film would be excessively polished through the chemical mechanical polishing, wherein the stopper layer is formed before or after forming the interlayer insulating film." On the contrary, Kuehne discloses all of the steps as claimed in claim 1 (see above rejection). In Figs. 1A-1C, Kuehne discloses that the stopper 146 is formed at the edge of "the device". Thus, Kuehne does meet the steps of claim 1 in the present invention.

As to claim 9, applicant argues that "Kuehne significantly differs from the invention of claim 1 because Kuehne's stopper layer 446 is provided over most of the substrate - not "only at an edge region" thereof as required by claim 1." The examiner notes that in figure 4A, the stopper layer 446 locates on the edge of the device. The stopper layer does not appear in the trenches nor at position of layer 442. Thus, Kuehne meets the claim language in claim 9 of the present invention.

As to Claim 10, applicant argues that the claim requires "forming a stopper layer over only an edge portion of the interlayer insulating film so that the stopper layer is located at an edge portion of the device but not at any central portion of the device." Kuehne meets the claim language because Kuehne shows that the stopper layer 446 locates on the edge of the device (see fig. 4A). The stopper layer does not appear in the trenches nor at position of layer 442.

Accordingly, applicant's allegations fail to overcome the rejection.

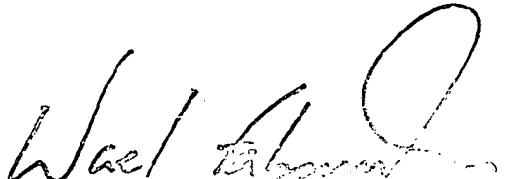
Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Vikki Trinh whose telephone number is (571) 272-1719. The Examiner can normally be reached Mon-Tuesday, Thurs-Friday, 7:30 AM - 6:00 PM Eastern Time. If attempts to reach the examiner by telephone are unsuccessful, the Examiner's supervisor, Mr. Wael Fahmy, can be reached at (571) 272-1705. General inquiries relating to the status of this application should be directed to the Group receptionist at (703) 308-0858. The fax number is (703) 308-2708.

Vikki Trinh,
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